REMARKS

Claims 1-21 and 31-38 are pending in the application. Claims 22-28 are withdrawn from consideration. Claims 29-30 were previously canceled.

The Examiner indicated the view that Claims 1-21, 31-38 (drawn to a sensor assembly - Group I) and Claims 22-28 (drawn to a method - Group II) are distinct. Applicant's Attorney affirms election of Claims 1-21, 31-38 (Group I) for prosecution, without traverse. Claims 22-28 are withdrawn as being directed to an un-elected invention.

Claim 1-3, 6-21 and 31-38 have been rejected under 35 USC 103(a) as being unpatentable over Wilner (US4093933) (hereinafter Wilner '933). Claims 4 and 5 have been rejected under 35 USC 103(a) as being unpatentable over Wilner '933 and further in view of Wilner (US4065970) (hereinafter Wilner '970). The rejections are respectfully traversed.

It may be helpful to review aspects of the present invention. Conventional silicon piezoresitive sensors have been used in pressure sensor technology applications such as aplanation tonometry. Typically, one surface of the piezoresistive sensor is placed against the eyeball, while another surface of the sensor includes piezoresistive gages, electrical connections, and support electronics. The surface presented to the biological medium, such as the eyeball, is generally highly contoured. Thus, a thin, sensitive region of that surface is surrounded by a thick, sturdy rim. Although the other surface remote from the pressure medium is substantially planar, this remote surface includes the electrical connections to the sensor such as wire bonds or plated leads that necessarily rise substantially above the plane. Connection to the remote surface's circuitry through the thickness of the rim is possible, but such a design approach would leave the gages and electrical traces exposed to the medium. Covering the gages and traces with a protective coating would diminish the sensitivity and stability of the sensor.

With the present invention, two diaphragms are used to overcome the limitations of the prior art. A silicon pressure sensor includes a first diaphragm provided with a surface for contacting a medium. The first diaphragm converts a pressure applied to the surface to a force, and transmits the force to a second diaphragm mated to the first diaphragm. The second diaphragm converts the force to an electrical signal. The second diaphragm has electronic circuitry for measuring the force.

In an embodiment, the first diaphragm includes an outer rim and a central boss which together define an annular recessed region. The second diaphragm includes an outer rim, a side island, and a central island. In an embodiment, the first and second diaphragms are arranged such that the force is transmitted from the boss of the first diaphragm to the central island of the second diaphragm.

Wilner '933 discloses a pressure transducer that includes a single diaphragm. Wilner '933 is directed to providing a pressure diaphragm sculptured to include plural thin flexures that form hinges between thick rigid portions. Strain sensitive means comprising piezoresitive semiconductive means is secured to the diaphragm to detect relative movement of the flexures. (Col. 1, lines 13-20; col. 5, lines 38-40, 60-65.)

Wilner '970 is directed to a diaphragm for a pressure transducer that has its surface sculptured to provide gauge areas in the form or narrow thin flexure areas between thick areas in the form of islands or motes. Linear piezoresistive gauges are diffused into the gauge areas for responding to bending of the flexure areas.

Thus, both Wilner '933 and Wilner '970 disclose typical single diaphragm devices that are subject to similar limitations as noted above for the prior art.

In the rejection, the Examiner acknowledges that Wilner '933 does not teach a second diaphragm. The Examiner states the view that an integral diaphragm able to convert pressure force to an electrical signal disclosed in Wilner '933 does not preclude its consisting of two diaphragms, and that it would be obvious to have a first and second diaphragm based on Wilner '933.

Applicants respectfully disagree with the Examiner. The Wilner '933 and Wilner '970 references each disclose devices that have non-planar surfaces (e.g., sculptured) facing the medium. Such non-planar or sculptured surfaces are not suitable for contacting certain medium such as in an aplanation tonomtery application.

In contrast, the present invention features a first diaphragm that contacts the medium on a planar surface and transmits pressure from the medium as a force to a second diaphragm that includes an electronic circuit for converting the pressure to an electrical signal. By providing a planar surface that does not include the electronics towards the medium, avoids exposing such

electronics of the device to the medium. The integral diaphragm of Wilner is not capable of this useful feature.

Claims 1 and 31 have been amended to recite that the surface of the first diaphragm is planar. Thus, claims 1 and 31 as amended are believed to be novel and non-obvious over the cited references. Reconsideration of the rejection is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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